

## PRANTL-M

Completed Technology Project (2016 - 2017)



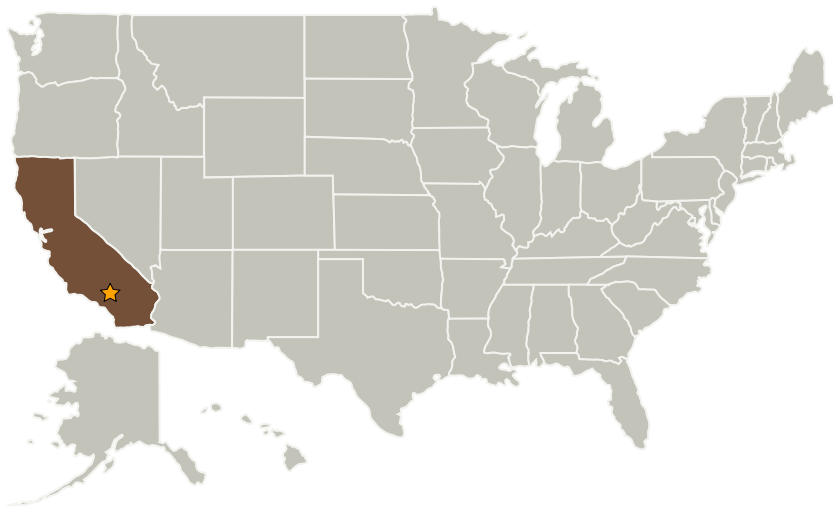
## Project Introduction

A CubeSat sized flying wing glider capable of science and terrain mapping missions on Mars. Designed to be much smaller, lighter, and cheaper than previous Mars airplane concepts. Applies PRANDTL bell lift distribution for stability and configuration simplicity with no tail and no vertical surfaces.

## Anticipated Benefits

The unique flight conditions of flying at a very low temperature, density, and pressure. Being a secondary payload for a Mars mission and fitting in a CubeSat greatly constrains mass and volume budget. In order to have reliable laminar flow and experimental airfoil data, need to increase Reynolds number as much as possible (current target  $Re=20,000$ ). Need to remain subsonic and keep wing loading low. Extremely harsh temperatures for both Earth and Mars flights, must insulate/heat batteries and electronics. Flight testing requires telemetry and broadcasting systems required for much larger vehicles, miniaturization work underway.

## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Armstrong Flight Research Center (AFRC)	Lead Organization	NASA Center	Edwards, California



Dave Berger, right, and John Bodylski prepare the Prandtl-M for a test flight.

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### Primary U.S. Work Locations

California

### Images



#### Project Image

Dave Berger, right, and John Bodylski prepare the Prandtl-M for a test flight.

(<https://techport.nasa.gov/image/35787>)

### Organizational Responsibility

#### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

#### Lead Center / Facility:

Armstrong Flight Research Center (AFRC)

#### Responsible Program:

Center Innovation Fund: AFRC CIF

### Project Management

#### Program Director:

Michael R Lapointe

#### Program Manager:

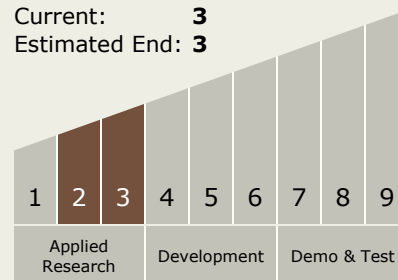
David F Voracek

#### Principal Investigator:

David E Berger

### Technology Maturity (TRL)

Start: 2  
Current: 3  
Estimated End: 3





## Technology Areas

### Primary:

- TX04 Robotic Systems
  - └ TX04.2 Mobility
    - └ TX04.2.2 Above-Surface Mobility

## Target Destination

Mars